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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,333	08/26/2003	Christophe Boyer	PET-1825D1	3535
23599	7590	05/01/2007	EXAMINER	
MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201			SEIFU, LESSANEWORK T	
		ART UNIT		PAPER NUMBER
		1709		
		MAIL DATE	DELIVERY MODE	
		05/01/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/647,333	BOYER ET AL.
	Examiner	Art Unit
	Lessanework T. Seifu	1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 26 August 2003.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 5-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 5-7 and 15 is/are rejected.
- 7) Claim(s) 8-14 and 16-21 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 26 August 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. 09/495,914.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 0/26/2003
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

## DETAILED ACTION

The abstract of the disclosure is objected to because the abstract contains information that is unrelated to the nature and substance of the technical disclosure. Correction is required. The examiner suggests deleting the last line of the abstract. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 5-7, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler, US 6,164,308 (US '308) in view of GB 2,036,606 (GB '606).

3. Regarding claim 5, the reference US '308 discloses a flow divider, which from the reference is construed to encompass a gas/liquid separator, having a gas flow outlet line and a liquid phase outlet line, the vessel having a variety of cluster configuration including one or more separators in the vessel having at least one side inlet and outflow for a gas and another outflow for a liquid (see column 4, lines 53-56). The above disclosure meets the limitation of claim 5 as an apparatus comprising separation vessel comprising primary and secondary separator having an inlet and second outlet. The reference US '308 is silent in regards to the apparatus having a system to limit the formation of liquid vortex.

Reference GB '606 teaches a gas/liquid separator having a system to prevent liquid being caught up by a vortex in the separator (see page 2, lines 1-5). It would have been obvious to one having ordinary skill in the art at the time the invention was

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made to have modified the vessel configuration in US '308 to include the feature disclosed in GB '606, because as the reference GB '606 teaches, addition of the above described feature in GB '606 can prevent liquid from being caught up in a vortex, further helping the separation of gas from liquid. Applicants' claimed limitations on the separators handling G/L flow ranges as claimed are not patentable distinction, because it is within the level of ordinary skill in the art to select separators for any G/L mass flow rates including the claimed flow ranges that best fit to yield an effective separation for a given process.

4. Regarding claim 6, applicants' claimed, dimension of the separation vessel and the position imposed on the normal level of liquid in the separation vessel so as to impose a specified range of residence time is not a patentable distinction, because it is within the level of ordinary skill in the art to select any dimension and any normal liquid level so as to impose a residence time efficient for a given separation process. As to the separator vessel achieving the claimed separation efficiencies, the reference US '308 discloses the flow divider having a gas outlet containing less than 1 percent liquid by volume (see column 4, lines 62-65), which includes zero, the examiner has noted that limitations in the claim are in weight percent.

5. Regarding claim 7, the reference US '608 teaches a vortex tube in the flow divider having at least one tangential outlet and causing the flow to leave at a 90 degree

(see figure 6). Applicants' claimed limitations to the ratio of the area of the tangential outlet and the area of the cross section of flow, and further limitation of the dimensions of the opening are not patentable distinction, because it is within the level of ordinary skill in the art to select dimensional and area proportions that best fit to yield an effective separation process.

6. Regarding claim 15 which further limits claim 6, the reference US '608 teaches a vortex tube in the flow divider having at least one tangential outlet and causing the flow to leave at a 90 degree (see fig. 6 in the reference). Applicants' claimed, limitations to the ratio of the area of the tangential outlet and the area of the cross section of flow, and further limitation of the dimensions of the opening are not patentable distinction, because it is within the level of ordinary skill in the art to select dimensional and area proportions that best fit to yield an effective separation process.

#### ***Allowable Subject Matter***

1. Claims 8-14, and 16-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The above claims would be allowable because the prior art does not disclose or suggest an apparatus configuration as defined by the applicants' dependent claims. The prior art fails to disclose or render obvious an apparatus comprising gas/liquid separation vessel having at least two separators, a system which limits the formation of liquid vortex, the first separator

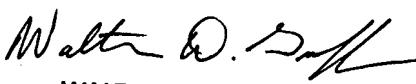
having a helix added inside the separator, the helix being a single or double helix, the ratio of the helix width, corresponding to the cross section of flow of the fluids, to the tube diameter being in the range of 0.5 to 1, and the pitch number of the helix being in the range of 1 to 6; the second separator comprising a cyclone with a free tangential inlet having a rectangular cross section, and the ratio of the width to the length of this cross section being in the range of 0.2 to 0.6; the system limiting the formation of a liquid vortex comprises blades attached to the wall of the gas/liquid separation vessel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lessanework T. Seifu whose telephone number is 571-270-3153. The examiner can normally be reached on Mon-Fri 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS

  
WALTER D. GRIFFIN  
SUPERVISORY PATENT EXAMINER